Andrew Ng

Andrew Yan-Tak Ng (Chinese: 吳恩達; born 1976) is a British-born American computer scientist and technology entrepreneur focusing on machine learning and AI.[2] Ng was a co-founder and head of Google Brain and was the former Chief Scientist at Baidu, building the company's Artificial Intelligence Group into a team of several thousand people.[3]

Ng is an adjunct professor at Stanford University (formerly associate professor and Director of its Stanford AI Lab or SAIL). Also a pioneer in online education, Ng co-founded Coursera and deeplearning.ai.[4] He has successfully spearheaded many efforts to "democratize deep learning" teaching over 2.5 million students through his online courses.[5][2] He is one of the world's most famous and influential computer scientists being named one of *Time* magazine's 100 Most Influential People in 2012, and *Fast Company*'s Most Creative People in 2014. Since 2018 he launched and currently heads AI Fund, initially a $175-million investment fund for backing artificial intelligence startups. He has founded Landing AI, which provides AI-powered SaaS products and Transformation Program to empower enterprises into cutting-edge AI companies.[6]

Contents

Andrew Ng	
Born	Andrew Yan-Tak Ng April 18, 1976[1] United Kingdom[1]
Nationality	United States
Alma mater	University of California, Berkeley (PhD) Massachusetts Institute of Technology (MS) Carnegie Mellon University (BS) Raffles Institution (High School)
Known for	Artificial Intelligence, Deep Learning, MOOC, Education technology
Spouse(s)	Carol E. Reiley
Children	1
Awards	2007 Sloan Fellowship, 2008. MIT Technology Review TR35, 2009. IJCAI Computers and Thought Award, 2013. Time 100 Most Influential People, 2013. Fortune's 40 under 40, 2013. CNN

Biography

Ng was born in United Kingdom in 1976. His parents are both immigrants from Hong Kong. Growing up, he spent time in Hong Kong and Singapore and later graduated from Raffles Institution in Singapore in 1992.[1]

In 1997, he earned his undergraduate degree with a triple major in computer science, statistics, and economics from Carnegie Mellon University in Pittsburgh, Pennsylvania graduating at the top of his class. Between 1996 and 1998 he also conducted research on reinforcement learning, model selection, and feature selection at the AT&T Bell Labs.[7]

In 1998 Ng earned his master's degree from the Massachusetts Institute of Technology in Cambridge, Massachusetts. At MIT he built the first publicly available, automatically indexed web-search engine for research papers on the web (it was a precursor to CiteSeer/ResearchIndex, but specialized in machine learning).[7]

In 2002, he received his PhD from the University of California, Berkeley under the supervision of Michael I. Jordan. His thesis is titled "Shaping and policy search in reinforcement learning" and is well cited to this day.[7][8]

He started working as an Assistant Professor at Stanford University in 2002, and as an Associate Professor at 2009.[9]

He currently lives in Los Altos Hills, California. In 2014, he married Carol E. Reiley and in February 2019 they had their first child, Nova.[10][11] The MIT Tech Review named Ng and Reiley an "AI power couple."

Career

Academia and teaching

Ng is a professor at Stanford University Department of Computer Science and Department of Electrical Engineering. He served as the Director of the Stanford Artificial Intelligence Lab (SAIL), where he taught students and undertook research related to data mining, big data, and machine learning. His machine learning course CS229 at Stanford the most popular course offered on campus with over 1000 students enrolling some years.[12][13] As of 2020, three of most popular courses on Coursera are Ng's: Machine Learning (#1), AI for Everyone, (#5), Neural Networks and Deep Learning (#6).[14]

In 2008 his group at Stanford was one of the first in the US to start advocating the use of GPUs in deep learning. The rationale was that an efficient computation infrastructure could speed up statistical model training by orders of magnitude, ameliorating some of the scaling issues associated with big data. At the time it

	10, 2014. Fast Company's Most Creative People in Business,
	2015. World Economics Forum Young Global Leaders
Scientific career	
Fields	Artificial intelligence, machine learning, natural language processing, computer vision
Institutions	Stanford University Google Brain Co-founder of Coursera Baidu Research
Thesis	*Shaping and Policy Search in Reinforcement Learning* (https://web.archive.org/web/20141222084445/http://www.cs.ubc.ca/~nando/550-2006/handouts/andrew-ng.pdf) (2003)
Doctoral advisor	Michael I. Jordan
Notable students	Ian Goodfellow Pieter Abbeel Quoc Le
Website	Stanford University — Andrew Ng (http://www.cs.stanford.edu/~ang)

Andrew Ng	
Traditional Chinese	吳恩達
Simplified Chinese	吴恩达
Transcriptions	
Standard Mandarin	
Hanyu Pinyin	Wú Ēndá
Yue: Cantonese	
Jyutping	ng4 jan1 daat6

was a controversial and risky decision, but since then and following Ng's lead, GPUs have become a cornerstone in the field.[15] Since 2017 Ng has been advocating the shift to High Performance Computing (HPC) for scaling up deep learning and accelerating progress in the field.[15]

In 2012, along with Stanford computer scientist Daphne Koller he co-founded and was CEO of Coursera, a website that offers free online courses to everyone.[2] It took off with over 100,000 students registered for Ng's popular CS229A course.[16] Today, several million people have enrolled in Coursera courses, making the site one of the leading MOOC's in the world.

Industry

From 2011 to 2012, he worked at Google, where he founded and directed the Google Brain Deep Learning Project with Jeff Dean, Greg Corrado, and Rajat Monga.

In 2014, he joined Baidu as Chief Scientist, and carried out research related to big data and A.I.[17] There he set up several research teams for things like facial recognition and Melody, an AI chatbot for healthcare (like Siri or Amazon's Alexa).[3] In March 2017, he announced his resignation from Baidu.[2][18]

He soon afterwards launched Deeplearning.ai, an online series of deep learning courses.[19] Then Ng launched Landing AI, which provides AI-powered SaaS products and Transformation Program to empower enterprises into cutting-edge AI companies.

In January 2018, Ng unveiled the AI Fund, raising $175 million to invest in new startups.[20]

Research

Ng researches primarily in machine learning, deep learning, machine perception, computer vision, and natural language processing; and is one of the world's most famous and influential computer scientists.[21] He's frequently won best paper awards at academic conferences and has had a huge impact on the field of AI, computer vision, and robotics.[22][23]

During graduate school, together with David M. Blei and Michael I. Jordan, coauthored the influential paper that introduced Latent Dirichlet allocation (LDA) for his thesis on reinforcement learning for drones.[24]

His early work includes the Stanford Autonomous Helicopter project, which developed one of the most capable autonomous helicopters in the world.[25][26] He was the leading scientist and principal investigator on the STAIR (STanford Artificial Intelligence Robot) project,[27] which resulted in ROS, a widely used open-source robotics software platform. His vision to build an AI robot and put a robot in every home inspired Scott Hassan to back him and create Willow Garage.[28] He is also one of the founding team members for the Stanford WordNet project, which uses machine learning to expand the Princeton WordNet database created by Christiane Fellbaum.[7][29]

In 2011, Ng founded the Google Brain project at Google, which developed large-scale artificial neural networks using Google's distributed computer infrastructure.[30] Among its notable results was a neural network trained using deep learning algorithms on 16,000 CPU cores, which learned to recognize cats after watching only YouTube videos, and without ever having been told what a "cat" is.[31][32] The project's technology is also currently used in the Android Operating System's speech recognition system.[33]

Online education: MOOCs

External audio

In 2011, Stanford launched a total of three Massive open online courses (MOOCs) on machine learning (CS229a), databases, and AI, taught by Ng, Peter Norvig, Sebastian Thrun, and Jennifer Widom.[35][36] This has led to the modern MOOC movement. Ng taught machine learning and Widom taught databases. The course on AI taught by Thrun led to the genesis of Udacity.[35] Coursera was the 6th online education website that Ng built and arguably the most successful to date.[37]

> But we learned and learned and learned from the early prototypes, until in 2011 we managed to build something that really took off.[37]

The seeds of Massive open online courses (MOOCs) go back a few years before the founding of Coursera in 2012. Two themes emphasized in the founding of modern MOOCs were *scale* and *availability*.[35]

Founding of Coursera

Ng started the Stanford Engineering Everywhere (SEE) program, which in 2008 published a number of Stanford courses online for free. Ng taught one of these courses, "Machine Learning", which includes his video lectures, along with the student materials used in the Stanford CS229 class. It offered a similar experience to MIT's Open Courseware except it aimed at providing a more "complete course" experience, equipped with lectures, course materials, problems and solutions, etc. The SEE videos were viewed by the millions and inspired Ng develop and iterate new versions of online tech.[35]

Within Stanford, they include Daphne Koller with her "blended learning experiences" and co-designing a peer-grading system, John Mitchell (Courseware, a Learning Management System), Dan Boneh (using machine learning to sync videos, later teaching cryptography on Coursera), Bernd Girod (ClassX), and others. Outside Stanford both Ng and Thrun credit Sal Khan of Khan Academy as a huge source of inspiration. Ng was also inspired by lynda.com and the design of the forums of Stack Overflow.[35]

Widom, Ng, and others were ardent advocates of Khan-styled tablet recordings, and between 2009 and 2011, several hundred hours of lecture videos recorded by Stanford instructors were recorded and uploaded. Ng tested some of the original designs with a local high school to figure the best practices for recording lessons.[35]

In October 2011, the "applied" version of the Stanford class (CS229a) was hosted on ml-class.org and launched, with over 100,000 students registered for its first edition. The course featured quizzes and graded programming assignments and became one of the first and most successful Massive open online courses (MOOCs) created by a Stanford professor.[38]

Two other courses on databases (db-class.org) and AI (ai-class.org) were launched. The ml-class and db-class ran on a platform developed by students, including Frank Chen, Jiquan Ngiam, Chuan-Yu Foo, and Yifan Mai. Word spread through social media and popular press. The three courses were 10 weeks long, and over 40,000 "Statements of Accomplishment" were awarded.[35]

Ng tells the following story on the early days of Coursera:

> In 2011, I was working with four Stanford students. We were under tremendous pressure to build new features for the 100,000+ students that were already signed up. One of the students (Frank Chen) claims another one (Jiquan Ngiam) frequently stranded him in the Stanford building and

refused to give him a ride back to his dorm until very late at night, so that he no choice but to stick around and keep working. I neither confirm nor deny this story.[37]

His work subsequently led to his founding of Coursera with Koller in 2012. As of 2019, the two most popular courses on the platform were taught and designed by Ng: "Machine Learning" (#1) and "Neural Networks and Deep Learning" (#2).

Post-Coursera work

In 2019, Ng launched a new course "AI for Everyone." This is a non-technical course designed to help people understand AI's impact on society and its benefits and costs for companies, as well as how they can navigate through this technological revolution.[39]

Venture capital

Ng is the chair of the board for Woebot Labs, a psychological clinic that uses data science to provide cognitive behavioral therapy. It provides a therapy chatbot to help treat depression, among other things.[40]

He is also a member of the board of directors for drive.ai, which uses AI for self-driving cars and was acquired by Apple in 2019.[41][42]

Through Landing AI, he also focuses on democratizing AI technology and lowering the barrier for entrance to businesses and developers.[6]

Publications and awards

Ng is also the author or co-author of over 300 , robotics, and related fields.[43] His work in computer vision and deep learning has been frequently featured in press releases and reviews.[44]

- 1995. Bell Atlantic Network Services Scholarship[45]
- 1995, 1996. Microsoft Technical Scholarship Award[45]
- 1996. Andrew Carnegie Society Scholarship[45]
- 1998-2000: Berkeley Fellowship[45]
- 2001-2002: Microsoft Research Fellowship[45]
- 2007. Alfred P. Sloan Research Fellowship Sloan Foundation Faculty Fellowship[46]
- 2008. MIT *Technology Review* TR35 (Technology Review, 35 innovators under 35)[47][48]
- 2009. IJCAI Computers and Thought Award (highest award in AI given to a researcher under 35)[49]
- 2009. Vance D. & Arlene C. Coffman Faculty Scholar Award
- 2013. Times 100 Most Influential People[50]
- 2013. Fortune's 40 under 40 [51]
- 2013. CNN 10: Thinkers[52]
- 2014. Fast Company's Most Creative People in Business[53]
- 2015. World Economics Forum Young Global Leaders[54]

He has co-refereed hundreds of AI publications in journals like NeurIPS. He has also been the editor for the Journal of Artificial Intelligence Research (JAIR), Associate Editor for the IEEE Robotics and Automation Society Conference Editorial Board (ICRA), and much more.[7]

He has given invited talks at NASA, Google, Microsoft, Lockheed Martin, the Max Planck Society, Stanford, Princeton, UPenn, Cornell, MIT, UC Berkeley, and dozens of other universities. Outside of the US, he has lectured in Spain, Germany, Israel, China, Korea, and Canada.[7]

He has also written for Harvard Business Review, HuffPost, Slate, Apple News, and Quora Sessions' Twitter.[55] He also writes a weekly digital newsletter called "The Batch."

Books

He also wrote a book "Machine Learning Yearning", a practical guide for those interested in machine learning, which he distributed for free.[56] In December 2018, he wrote a sequel called "AI Transformation Playbook".[57]

Ng contributed one chapter to *Architects of Intelligence: The Truth About AI from the People Building it* (2018) by the American futurist Martin Ford.

Views on AI

Ng is one of the scientists credited with bringing humanity to AI. He believes that AI technology will improve the lives of people, not that it is an anathema that will "enslave" the human race.[3] Ng believes the potential benefits of AI outweigh the threats, which he believes are exaggerated. [58] He has stated that

> Worrying about AI evil superintelligence today is like worrying about overpopulation on the planet Mars. We haven't even landed on the planet yet![58]

A real threat is regarding the future of work: "Rather than being distracted by evil killer robots, the challenge to labour caused by these machines is a conversation that academia and industry and government should have."[59] A particular goal of Ng's work is to "democratize" AI learning so that people can learn more about it and understand its benefits. Ng's stance on AI is shared by Mark Zuckerberg, but opposed by Elon Musk.[59]

In 2017, Ng said he supported basic income to allow the unemployed to study AI so that they can re-enter the workforce. He has stated that he enjoyed Erik Brynjolfsson and Andrew McAfee's "The Second Machine Age" which discusses issues such as AI displacement of jobs.[60]

See also

- Robot Operating System
- Latent Dirichlet allocation
- Google Brain
- Coursera

References

1. Seligman, Katherine (December 3, 2006). "If Andrew Ng could just get his robot to assemble an Ikea bookshelf, we'd all buy one" (http://www.sfgate.com/magazine/article/If-Andrew-Ng-could-just-get-his-robot-to-assemble-2484400.php). *SFGate*. Retrieved February 12, 2013.
2. Terdiman, Daniel (March 22, 2017). "Baidu's head of artificial intelligence is stepping down" (https://www.fastcompany.com/4032920/baidus-head-of-artificial-intelligence-is-stepping-down). *Fast Company*. Retrieved April 17, 2019.
3. Mozur, Paul (March 22, 2017). "A.I. Expert at Baidu, Andrew Ng, Resigns From Chinese Search Giant" (https://www.nytimes.com/2017/03/22/business/baidu-artificial-intelligence-andrew-ng.html). *The New York Times*. ISSN 0362-4331 (https://www.worldcat.org/issn/0362-4331). Retrieved April 17, 2019.
4. "Andrew Ng — Stanford University | Coursera" (https://www.coursera.org/instructor/andrewng). *Coursera*. Retrieved August 29, 2017.
5. *Andrew Ng at Amazon re:MARS 2019* (https://www.youtube.com/watch?v=j2nGxw8sKYU), retrieved November 20, 2019
6. "Home" (https://landing.ai/). *Landing AI*. Retrieved April 17, 2019.
7. Ng, Andrew. "Cirriculum Vitae—Andrew Y. Ng" (https://ai.stanford.edu/~ang/curriculum-vitae.pdf) (PDF).
8. Ng, Andrew (2003). "Shaping and policy search in Reinforcement Learning" (http://rail.eecs.berkeley.edu/deeprlcourse-fa17/docs/ng-thesis.pdf) (PDF).
9. Ng, Andrew Y. (May 20, 2015). "Curriculum Vitæ—Andrew Y. Ng" (https://ai.stanford.edu/~ang/curriculum-vitae.pdf) (PDF). *Stanford Artificial Intelligence Laboratory*. Retrieved October 9, 2020.
10. "Inside The Mind That Built Google Brain: On Life, Creativity, And Failure" (https://www.huffingtonpost.com/2015/05/13/andrew-ng_n_7267682.html). *The Huffington Post*. May 13, 2015. Retrieved December 19, 2015.
11. Ng, Andrew (February 20, 2019). "Announcing Nova Ng, our first daughter. Plus, some thoughts on the AI-powered world she will grow up in..." (https://twitter.com/AndrewYNg/status/1098331008544399360) *@AndrewYNg*. Retrieved March 7, 2019.
12. "Why Is Machine Learning (CS 229) The Most Popular Course At Stanford?" (https://www.forbes.com/sites/anthonykosner/2013/12/29/why-is-machine-learning-cs-229-the-most-popular-course-at-stanford/). *Forbes*. 2013.
13. "CS229: Machine Learning" (http://cs229.stanford.edu/). *cs229.stanford.edu*. Retrieved April 17, 2019.
14. Mundial, Foro Económico (October 27, 2020). "Coursera's Most Popular Online Courses" (https://www.entrepreneur.com/article/358518). *Entrepreneur*. Retrieved December 26, 2020.
15. "What does Andrew Ng think about Deep Learning? – Quora" (https://www.quora.com/What-does-Andrew-Ng-think-about-Deep-Learning). *quora.com*. Retrieved April 17, 2019.
16. Friedman, Thomas L. (May 15, 2012). "Opinion | Come the Revolution" (https://www.nytimes.com/2012/05/16/opinion/friedman-come-the-revolution.html). *The New York Times*. ISSN 0362-4331 (https://www.worldcat.org/issn/0362-4331). Retrieved February 19, 2018.
17. Gannes, Liz (May 16, 2014). "Baidu Hires Coursera Founder Andrew Ng to Start Massive Research Lab" (https://www.recode.net/2014/5/16/11626966/baidu-hires-coursera-founder-andrew-ng-to-start-massive-research-lab). *Recode*. Retrieved August 29, 2017.
18. "Opening a new chapter of my work in AI" (https://medium.com/@andrewng/opening-a-new-chapter-of-my-work-in-ai-c6a4d1595d7b). 2017. Retrieved May 16, 2014.
19. Ng, Andrew (August 8, 2017). "deeplearning.ai: Announcing new Deep Learning courses on Coursera" (https://medium.com/@andrewng/deeplearning-ai-announcing-new-deep-learning-courses-on-coursera-43af0a368116). *Medium*. Retrieved February 19, 2018.
20. "Andrew Ng unveils the AI Fund, with $175 million to back new startups | VentureBeat" (https://venturebeat.com/2018/01/30/andrew-ng-unveils-the-ai-fund-with-175-million-to-back-new-startups/). *venturebeat.com*. January 30, 2018. Retrieved February 19, 2018.

21. "One of the world's most famous computer scientists reveals his 'playbook' for bringing AI to every business" (https://www.businessinsider.com/andrew-ng-ai-artificial-intelligence-playbook -2018-12). *Business Insider*. 2018.
22. "Andrew Ng - Publications" (http://www.robotics.stanford.edu/~ang/papers.php). *www.robotics.stanford.edu*. Retrieved December 26, 2020.
23. "publications" (http://ai.stanford.edu/~pabbeel/publications.html). *ai.stanford.edu*. Retrieved December 26, 2020.
24. David M. Blei, Andrew Y. Ng, Michael I. Jordan. Latent Dirichlet allocation. The Journal of Machine Learning Research, Volume 3, January 3, 2003, which is one of the two papers that independently discovered Latent Dirichlet allocation
25. "From Self-Flying Helicopters to Classrooms of the Future" (http://chronicle.com/article/From-S elf-Flying-Helicopters/134666/). *Chronicle of Higher Education*. 2012.
26. "Stanford Autonomous Helicopter Project" (http://heli.stanford.edu).
27. John Markoff (July 18, 2006). "Brainy Robots Start Stepping Into Daily Life" (https://www.nytime s.com/2006/07/18/technology/18brain.html). *New York Times*.
28. Markoff, John (2015). *Machines of Loving Grace: The Quest for Common Ground between humans and robots*. 195 Broadway, New York, NY: HarperCollins. ISBN 978-0-06-226668-2.
29. "The Stanford Wordnet Project" (https://ai.stanford.edu/~rion/swn/). *ai.stanford.edu*. Retrieved April 17, 2019.
30. Claire Miller and Nick Bilton (November 3, 2011). "Google's Lab of Wildest Dreams" (https://ww w.nytimes.com/2011/11/14/technology/at-google-x-a-top-secret-lab-dreaming-up-the-future.htm l). *New York Times*.
31. John Markoff (June 25, 2012). "How Many Computers to Identify a Cat? 16,000" (https://www.ny times.com/2012/06/26/technology/in-a-big-network-of-computers-evidence-of-machine-learnin g.html). *New York Times*.
32. Ng, Andrew; Dean, Jeff (2012). "Building High-level Features Using Large Scale Unsupervised Learning". arXiv:1112.6209 (https://arxiv.org/abs/1112.6209) [cs.LG (https://arxiv.org/archive/cs. LG)].
33. "Speech Recognition and Deep Learning" (http://googleresearch.blogspot.com/2012/08/speec h-recognition-and-deep-learning.html). *Google Research Blog*. August 6, 2012. Retrieved January 29, 2013.
34. "Interview with Coursera Co-Founder Andrew Ng" (http://degreeoffreedom.org/interview-with-c oursera-co-founder-andrew-ng/). Degree of Freedom. May 17, 2013. Retrieved May 19, 2013.
35. Ng, Andrew; Widom, Jennifer. "Origins of the Modern MOOC" (https://www.andrewng.org/portfol io/origins-of-the-modern-mooc-xmooc/).
36. Ng, Andrew; Widom, Jennifer. "Origins of the Modern MOOC (xMOOC)" (https://ai.stanford.edu/ ~ang/papers/mooc14-OriginsOfModernMOOC.pdf) (PDF).
37. "What are some good stories from the early days of Coursera? – Quora" (https://www.quora.co m/What-are-some-good-stories-from-the-early-days-of-Coursera). *quora.com*. Retrieved April 17, 2019.
38. Theresa Johnson. "Stanford for All" (http://alumni.stanford.edu/get/page/magazine/article/?articl e_id=55991). *Stanford Magazine*.
39. Ng, Andrew (November 14, 2018). "Announcing "AI for Everyone": a new course from deeplearning.ai" (https://medium.com/@andrewng/announcing-ai-for-everyone-a-new-course-fr om-deeplearning-ai-44b609c042f). *Medium*. Retrieved December 14, 2018.
40. "Woebot – Your charming robot friend who is here for you, 24/7" (https://woebot.io/). *woebot.io*. Retrieved April 17, 2019.
41. "Andrew Ng LinkedIn page" (https://www.linkedin.com/in/andrewyng/).
42. "Home » drive.ai » the self-driving car is here" (https://www.drive.ai/). *drive.ai*. Retrieved April 17, 2019.

43. "Andrew Ng – Google Scholar Citations" (https://scholar.google.com/citations?user=mG4imME AAAAJ&oi=sra). *scholar.google.com*. Retrieved December 14, 2018.
44. New algorithm improves robot vision (http://news.stanford.edu/news/2005/december7/robotsee -120705.html)
45. "Andrew Ng's CV" (http://ai.stanford.edu/~ang//curriculum-vitae.pdf) (PDF).
46. https://www.cs.cmu.edu/~scsfacts/alumni-sloan.html (https://www.cs.cmu.edu/~scsfacts/alumni-sloan.html). Missing or empty |title= (help)
47. "2008 Young Innovators Under 35" (http://www.technologyreview.com/tr35/?year=2008). Technology Review. 2008. Retrieved August 15, 2011.
48. Technology Review: TR35 (http://www.technologyreview.com/tr35/Profile.aspx?TRID=730)
49. "IJCAI Awards | IJCAI" (https://www.ijcai.org/awards). *www.ijcai.org*. Retrieved December 26, 2020.
50. at the age of 37 Emanuel, Ezekiel. "The 2013 TIME 100" (http://time100.time.com/2013/04/18/ti me-100/slide/andrew-ng-and-daphne-koller/). *Time*. ISSN 0040-781X (https://www.worldcat.or g/issn/0040-781X). Retrieved February 19, 2018.
51. "Fortune's 40 under 40 – The hottest young stars in business" (http://fortune.com/2013/09/19/for tunes-40-under-40-the-hottest-young-stars-in-business/). *Fortune*. Retrieved February 19, 2018.
52. "The CNN 10: Thinkers" (http://www.cnn.com/interactive/2013/10/tech/cnn10-thinkers/). *CNN*. Retrieved December 26, 2020.
53. Staff, Fast Company (January 29, 2014). "Most Creative People In Business 1000: The Complete List" (https://www.fastcompany.com/3025456/most-creative-people-in-business-1000 -the-complete-list). *Fast Company*. Retrieved December 26, 2020.
54. *World Economics Forum* (PDF) http://www3.weforum.org/docs/AMNC14/WEF_AMNC14_ScienceTechnology_Brochure.pdf (ht tp://www3.weforum.org/docs/AMNC14/WEF_AMNC14_ScienceTechnology_Brochure.pdf). Missing or empty |title= (help)
55. "Andrew Ng – Quora" (https://www.quora.com/profile/Andrew-Ng). *quora.com*. Retrieved April 17, 2019.
56. "Machine Learning Yearning" (http://www.mlyearning.org/). 2017.
57. "AI Transformation Playbook How to lead your company into the AI era" (https://landing.ai/ai-tra nsformation-playbook/). *Landing AI*. December 13, 2018. Retrieved December 14, 2018.
58. "Is AI an existential threat to humanity? – Quora" (https://www.quora.com/Is-AI-an-existential-thr eat-to-humanity). *quora.com*. Retrieved April 17, 2019.
59. hermes (August 1, 2017). "Zuckerberg and Musk are arguing about the dangers of AI - they're both wrong" (https://www.straitstimes.com/world/zuckerberg-and-musk-are-arguing-about-the-d angers-of-ai-theyre-both-wrong). *The Straits Times*. Retrieved December 26, 2020.
60. "How will work and jobs change by 2035? – Quora" (https://www.quora.com/How-will-work-and -jobs-change-by-2035). *quora.com*. Retrieved April 17, 2019.

External links

- Homepage (https://ai.stanford.edu/~ang/)
- Ng's Quora profile (https://www.quora.com/profile/Andrew-Ng)
- Ng's Medium blog (https://medium.com/@andrewng)
- Academic Genealogy (http://phdtree.org/scholar/ng-andrew-y/)